



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

April 23, 2015

Via Certified Mail #7014 2870 0001 9579 3146
Return Receipt Requested

REPLY TO THE ATTENTION OF:
LU-9J

Keith Nagel
General Manager, Env. Affairs and Real Estate
ArcelorMittal Indiana Harbor LLC West
3001 Dickey Road
East Chicago, Indiana 46312

Re: Former Coke Plant Area, Supplemental Site Investigation Report
ArcelorMittal Indiana Harbor LLC West (ArcelorMittal West) facility, East Chicago, Indiana
RCRA Docket No. R3013-5-03-002; EPA Facility ID IND 005 462 601

Dear Mr. Nagel:

EPA has reviewed your July 2014 Response to EPA Comments on the Former Coke Plant Area, Supplemental Site Investigation Report for the ArcelorMittal Indiana Harbor LLC West Mill (ArcelorMittal West) facility in East Chicago, Indiana. EPA's review focused on technical adequacy and consistency with Agency policy. EPA comments on your prior response are included in the enclosure and are required to be addressed in the final revised report.

As discussed in the response to comments, ArcelorMittal intends to prepare a pre-design work plan to address the additional delineation work requested by EPA, and pre-design remedial activities required to enable completion of a Corrective Measures Study report. Based on EPA's review, the following additional activities need to be included in the pre-design plan to address data gaps at the Former Coke Plant Area at the ArcelorMittal West facility:

- Sampling and evaluation of the uppermost 2 feet, not just the uppermost 6 inches, of soil, particularly at areas with surface soil data quality objective (DQO) exceedances;
- Sampling to confirm that soil between 2-8 ft bgs at boring MW-824D does not contain DQO exceedances;
- Advancement of a soil boring in the immediate vicinity of boring MW-826M in an effort to delineate the vertical extent of PAH contamination in this area;
- Steps to confirm and document that the aquitard is continuous across the site.

In addition, concerns regarding the proposed 5-step process for evaluating risks to aquatic organisms in the Indiana Harbor Ship Canal in the Enclosure (General Comment 3) will need to be addressed in order for EPA to approve the Supplemental Report.

Please submit a revised report which addresses the comments in this letter and the enclosure, and a pre-design work plan, within 60 days of your receipt of this correspondence. If you have any questions, please contact me at 312-886-6760.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Mikulka', with a stylized flourish at the end.

Michael Mikulka, P.E.
Senior Environmental Engineer
Remediation & Reuse Branch
Land & Chemicals Division

Enclosure

cc: Thomas Barnett, Environmental Manager
Jeanne Tarvin, Environ
Mike Sickels, IDEM

**TECHNICAL REVIEW
JULY 2014 RESPONSE TO EPA COMMENTS
ON THE ADDITIONAL SITE INVESTIGATION REPORT
FOR THE FORMER COKE PLANT
ARCELORMITTAL INDIANA HARBOR WEST
EAST CHICAGO, INDIANA**

EPA has completed a technical review of ArcelorMittal's July 11, 2014 response to EPA comments on the January 2014 Additional Site Investigation Report for the Former Coke Plant at the ArcelorMittal Indiana Harbor LLC West facility in East Chicago, Indiana. EPA's review focused on technical adequacy and consistency with Agency policy. The comments below are organized as numbered in the original EPA comments dated February 21, 2014.

I. GENERAL COMMENTS

1. EPA's original comment requested confirmation that geotextile fabric and at least two feet of fill have been placed over all previously identified areas of contamination exceeding Indiana Department of Environmental Management (IDEM) direct contact data quality objectives (DQOs). In its response, ArcelorMittal indicates that historical records on fabric and fill placement are unavailable because the construction contractor has gone out of business. In the absence of such records, the direct contact pathway must be considered potentially complete at the former Coke Plant, and the report text and conceptual site model should be modified accordingly. To address this issue, the facility proposes to develop and implement a more detailed surface soil sampling plan as part of the Pre-Design Investigation. EPA agrees with this approach.

You also note that there is a formal dig-permit program in place, and that a deed restriction will be implemented to ensure that any future users will understand the risks and use appropriate protection during intrusive construction activities, should ArcelorMittal vacate the site. EPA agrees with this approach.

The report cites EPA approval of a six-inch cover at the ArcelorMittal East Mill and requests that a similar thin cover be approved by EPA for the former Coke Plant area. Thus, the proposed sampling would target only the uppermost 6 inches of soil in its assessment of potential DQO exceedances. However, the response does not provide any details on the basis for determining that a six-inch cover was acceptable for the East Mill (or portions thereof). Unless there are extenuating circumstances, EPA policy is to evaluate contaminant concentrations in the uppermost two feet of soil/fill for potential direct contact exposures. IDEM direct contact criteria also apply to this typical contact zone (i.e., 0 to 2 feet of soil/fill below ground surface [bgs]).

Based on these Agency policies, EPA reiterates the requirement that ArcelorMittal must show that at least two feet (and up to six feet) of soil has been placed over all areas with surface soil DQO exceedances before the direct contact pathway is confirmed as incomplete. Consequently, the Pre-Design Investigation Plan must include sampling and evaluation of the uppermost two feet, not just the uppermost six inches, of soil, to verify that the direct contact DQO is met. This is especially critical if portions of the former Coke Plant area may be redeveloped for recreational, commercial or other non-industrial purposes in the future.

2. The response to this comment is acceptable.
3. Please note that EPA does not approve the use of the 10x dilution factor proposed as part of the evaluation of ecological risks from groundwater within the Indiana Harbor Ship Canal or Lake Michigan. The 10x dilution factor you referenced is used within EPA's internal groundwater environmental indicator report, but is not appropriate to use as you have suggested in your response. As is noted in your response, in a screening level ecological assessment (SERA), maximum values are compared to the conservative screening values, or to "no observable adverse effects level (NOAEL) benchmarks. The first step in the ERA is therefore to screen maximum concentrations, with no dilution, of each constituent found in the groundwater, against the ESLs. Those constituents that exceed the ESLs are retained for further evaluation in a baseline ecological risk assessment (BERA). Less conservative benchmarks, or lowest observable adverse effects level (LOAEL) benchmarks are used as part of the BERA. A tiered approach is presented in the responses to select LOAELs for use in the BERA.

In the response to General Comment 3, ArcelorMittal acknowledges that aquatic organisms in the Indiana Harbor Ship Canal may be exposed to contaminants via groundwater discharge, and proposes a 5-step process for evaluating risks to aquatic organisms in the Indiana Harbor Ship Canal. ArcelorMittal should address the following concerns regarding the proposed 5-step approach:

- Step 1 is acceptable. Refinement of the conceptual site model is an important first step in understanding contaminant fate and transport.
- EPA does not agree with the approach laid out in Step 2. It is not appropriate as a refinement of the ecologically based bench mark, or better stated, the first tier in selecting a LOAEL, to multiply the ESLs by 10. Although it is appropriate to calculate a NOAEL from a LOAEL assuming a 10 fold lower effect, it is not appropriate to apply this logic in reverse; that is, to calculate a LOAEL from a NOAEL. The actual lowest level of effects can be missed using this approach. Oftentimes the LOAEL is only a fraction higher than the NOAEL. Using the approach you suggest would result in a LOAEL bench mark that is not conservative enough and is not

acceptable for use in this ERA. As mentioned above, all methodologies used within the EPA groundwater environmental indicator report are not appropriate for use in the ERA. The first tier in selecting a LOAEL should be the selection of EPA's chronic ambient water quality criteria (AWQC). Many ESLs are already based on AWQC. The next appropriate tier would be the application of IDEM's AWQC, followed by Michigan DEQ's final chronic values (FCVs).

If a constituent still lacks an appropriate LOAEL, then a literature search is appropriate, keeping in mind that the effects level should not exceed 20%. Also, for constituents lacking ambient water quality criteria and for which ArcelorMittal derives literature-based values, the following information should be provided to support the derived values: a detailed description of literature search and review methods, a tabulation of study methods and results for all relevant studies identified in the literature, and a complete description of the rationale for the final toxicity values selected for use in the risk assessment.

- Use of the 95% upper confidence level on the mean (95% UCL) is appropriate as part of Step 3. It is not clear how professional judgment would be used "to determine the likelihood that concentrations at the groundwater/surface water interface do or will exceed refined ecological benchmarks." It would seem that the concentrations either exceed the benchmarks or they do not; professional judgment does not seem to apply.
- Step 4: Regarding refined ecological benchmarks, note that EPA and state ambient water quality criteria are typically developed based only on direct exposure to aquatic organisms, and use of these criteria may not be adequately protective of exposures through food web pathways. Additional methods for evaluating dietary risks to aquatic life may be needed for persistent, bio-accumulative, and toxic chemicals. Risks to higher level trophic receptors need to be considered through food chain modeling, if necessary.
- Additional detail regarding the calculation of the refined exposure point concentrations (EPC) is needed prior to approval. Please tabulate all monitoring wells and sample dates that will be included in the EPC calculations, and describe the approach that will be taken with respect to time-series data. It may be most efficient if EPA and ArcelorMittal reach agreement on these details before EPC and risk calculations are conducted.
- Note that ArcelorMittal should discuss, and EPA will consider, the uncertainty around any qualitative evaluations of fate and transport. Quantitative evaluation is preferred.

In addition, ArcelorMittal should confirm that there is no discharge of groundwater to bottom sediments in the Indiana Harbor Ship Canal (i.e., that groundwater only discharges to the canal through breaches in sheet pile wall). If this assumption is not correct, additional ecological risk evaluation will be required.

Also see EPA's response to Comment 16, as it relates to this comment.

4. The majority of this response is acceptable, but two concerns remain:
 - On page 8 of the response letter, ArcelorMittal asserts that the vertical extent of arsenic has been delineated at boring MW-824D. However, soil samples were only collected from two intervals (1-2 feet bgs, and well below the water table at 38.5-39.5 feet bgs). Although we agree that the water table (at approximately 8 feet bgs) can be used to vertically delineate the extent of contamination, there is no data with which to confirm that soil between 2 and 8 feet bgs at boring MW-824D does not contain DQO exceedances. This data gap should be addressed during the planned Pre-Design Investigation.
 - On page 8 of the response letter, ArcelorMittal also asserts that the extent of polynuclear aromatic hydrocarbons (PAH) exceedances found in the uppermost soil sample at boring MW-826M cannot be vertically delineated due to insufficient soil recovery between 2 and 9 feet bgs. The Pre-Design Investigation should also include advancement of a soil boring in the vicinity of boring MW-826M in an effort to delineate the vertical extent of PAH contamination in this area.
5. The response to this comment is acceptable.
6. The response to this comment is acceptable.

II. SPECIFIC COMMENTS

Section 2.2.2, Groundwater Sample Results, page 10

1. In the response, ArcelorMittal indicates that "the clay layer is laterally extensive across the former Coke Plant site." However, just because the clay may be extensive does not mean that it is continuous and, therefore, capable of acting as a hydraulic barrier to contaminant migration. The report must provide additional detail as to whether the clay has been consistently identified in each boring of similar depth at the former Coke Plant site. If an insufficient number of borings has been advanced to this depth, the Pre-Design Investigation should also include steps to confirm and document that the aquitard is continuous across the site.

Section 2.2.2, Site-Specific Hydrogeology, pages 16 and 17

2. The response to this comment is largely acceptable, but the revised text should note that mounding in the northeastern portion of the site was observed in *both* shallow and deep groundwater in July 2013.
3. The response to this comment is acceptable.

Section 4.1, Soil Sample Data Quality Review, pages 18-20

4. The response to this comment is acceptable.
5. The portion of this response addressing data gaps in contaminant delineation is acceptable. However, the revised text must be further modified as discussed in General Comment 1 above. Based on currently available information, we cannot find that the direct contact pathway has been eliminated.
6. The response to this comment is acceptable.

Section 4.2, Groundwater Sample Data Quality Review, pages 20-22

7. The response to this comment is acceptable.

Section 5.3, Monitoring Well Installation, page 25

8. The response to this comment is acceptable.

Section 5.4, Groundwater Sampling Procedures, pages 25 and 26

9. The response to this comment is acceptable.

Section 6.1, Slag-Fill/Soil Sample Results, pages 28-30

10. The response to this comment is acceptable.

Section 6.2, Groundwater Sample Results, page 30

11. The response to this comment is acceptable.

Section 6.1.2.3 (sic), Polynuclear Aromatic Hydrocarbons, page 35

12. The response to this comment is acceptable.

Section 6.1.2.4 (sic), Select Metals, pages 35 and 36

13. ArcelorMittal is correct in that the first paragraph on page 36 already notes that arsenic exceeded its IDEM maximum contaminant level (MCL) in wells MW-805S in July 2013. The original comment inadvertently referred to the MCL, when it should have requested that the text be revised to note that arsenic exceeded the IDEM industrial DQO in well MW-805S in July 2013. Revise the second half of the paragraph accordingly.
14. The response to this comment is acceptable.

Section 6.1.2.6 (sic), Applicability of Ecological Screening Levels, pages 37-40

15. The response to this comment is acceptable.
16. The Response to Specific Comment 16 needs to be revised, consistent with the discussion in Response to General Comment 3. ArcelorMittal appears to be proposing the same approach to human health risk assessment. That approach would also not be appropriate. The text identifies arsenic, benzene, toluene, and pentachlorophenol as constituents for further evaluation for potential human health and ecological risk. However, based on review of Table 11, this list appears relevant to human health risk only. The list of constituents to be evaluated further for ecological risk, according to the approach described in General Comment 3, should include all constituents that exceed the ecological screening level. Aquatic impacts related to conventional parameters ammonia, chloride and phenols should also be addressed. There appear to be significant ammonia and chloride contamination at depth.

With respect to human health risk, EPA concurs with the plan to perform a Focused Human Health Tiered Risk Assessment for further human health risk evaluation at the site. This Tiered assessment would be focused specifically on groundwater contaminants which currently discharge or have the potential to discharge to surface water. The EPA has the following comments and requirements for the Focused Assessment:

(a) EPA will view the proposed Focused assessment as a baseline evaluation for all detected contaminants which have the potential to contribute to discharges to surface water based on the available groundwater monitoring data. (Response 16 cites a “less than 10 times the applicable groundwater standard” as a factor applied in the groundwater environmental indicator report. That procedure is useful for evaluating the need for groundwater migration controls, but it is not appropriate as a screening procedure for a baseline risk assessment.) Consequently, EPA does not believe that it is appropriate to screen out all of the constituents which have maximum detected concentrations less than ten times higher than their respective drinking water standards. Those constituents could also contribute to the baseline exposure and health risk associated with groundwater releases to surface water. The list of detected “Constituents in

Groundwater” shown in Table 11 of the letter response appears to be the appropriate starting list for constituents of concern (COCs) in the human health assessment. If there are constituents in Table 11 which are concern for a baseline ecological assessment but not for a baseline human health assessment, those constituents may be candidates for removal from the COC list after appropriate rationale is provided.

(b) For Step 1 of the Tiered assessment, it would be appropriate for the COCs identified in #1) above to have individual exposure point concentrations determined by calculating 95%UCL mean concentrations. That approach is acceptable with the following conditions. The EPA ProUCL procedure and recommendations should be followed (<http://www.epa.gov/osp/hstl/tsc/software.htm>). The assessment needs to explain which set of groundwater data will be used for the calculations. For example, will only data from monitoring wells located immediately upgradient of the breached sheet pile wall be used, and will data from all sampling events be used. If the recent groundwater constituent data show significant upward (or downward) trends in concentration, then the effect of concentration trends on the calculated UCL concentrations should be addressed in the analysis. (The ProUCL guidance also presents options for handling non-detect values.)

(c) For Step 2, the assessment must explain why the apparent proposed exposure scenario (i.e., very short-term whole body exposure) is the appropriate conservative and only exposure scenario needed for the risk evaluation of all the COCs. This concern is relevant in light of the potential for long-term or chronic continuing COC discharges from groundwater that could have a range of physical-chemical properties (e.g., volatile, semivolatile, deposition to sediments). As suggested for Step 2, after the baseline individual and cumulative risks and hazard estimates are calculated, the assessment may consider uncertainty and sensitivity factors such as the effects of dilution, comparison to federal/state groundwater standards, and COC fate and transport.

(d) For Step 3, the assessment should identify the individual COCs or combination of COCs that exceed risk or hazard index limits. The assessment can explain how already planned remediation methods might mitigate those risks. But EPA is likely to require confirmation sampling (e.g., groundwater, soil contaminant sources) before concluding that no further action is required.

Section 7.1, Site Geology and Hydrogeology, page 43

17. The response to this comment is acceptable.

Section 7.2, Soil Conditions, pages 43 and 44

18. The response to this comment is acceptable.

Section 7.4, LNAPL Conditions, page 46

19. The response to this comment is acceptable, although clarification of ArcelorMittal's intent is required. EPA's assumption is that you will evaluate the extent of LNAPL contamination in the pre-design investigation and the remedial objective is remove the source and the accumulated NAPL as part of the remedy.

Figure 10, DQO Exceedances in Soil

20. The response to this comment is acceptable.

Figure 11, DQO Exceedances in Shallow Groundwater

21. The response to this comment is acceptable.

Figure 12, DQO Exceedances in Intermediate Groundwater

22. The response to this comment is acceptable.

Figure 13, DQO Exceedances in Deep Groundwater

23. The response to this comment is acceptable.

Figure 14, Benzene Isoconcentrations in Shallow Groundwater

24. Although the figures have been revised to use dashed lines showing the inferred nature of the contaminant footprint, there is still uncertainty with regard to the extent of exceedances west of well MW-819S/D and south of well MW-824S/D. Dashed lines should also be used to project the contaminant footprint in groundwater in these areas.

Figure 16, Benzene Isoconcentrations in Deep Groundwater

25. The response to this comment is acceptable.

Table 11, Evaluation of ESLs

26. The response to this comment is acceptable.